



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY

(DEEMED TO BE UNIVERSITY)

Accredited A++ Grade by NAAC | 12B Status by UGC | Approved by AICTE

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School of Computing

Department of Information Technology

1.1.3 Courses having focus on Employability / Entrepreneurship / Skill Development CONTENTS

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SITA1401	DATA COMMUNICATION AND COMPUTER NETWORKS	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To understand the network architecture and protocols supported for connecting devices in a network.
- To gain the knowledge of framing in data link layer.
- To learn the functions of network layer and the routing strategies with their associated protocols.
- To introduce the protocols used for end to end packet delivery in transport layer.
- To understand the application layer protocols.

UNIT1 DATA COMMUNICATION

9 Hrs.

Introduction to data communication - Network protocols & standards - Line configuration - Topology - Transmission mode - Categories of networks - OSI model - Layers of OSI model - TCP/IP Model – Transmission media - Guided media - Unguided media- Switching-Circuit Switching - Packet Switching.

UNIT 2 DATALINK LAYER

9 Hrs.

Error detection and correction– Line Discipline - Flow Control - Error control- Medium Access Control – Ethernet - CSMA/CD - Wireless LAN - CSMA/CA – IEEE 802.11, Bluetooth.

UNIT 3 NETWORK LAYER

9 Hrs

Routing - Distance Vector Routing - Link State Routing - Addressing-Subnetting - IPV4- IPV6- ARP - RARP - ICMP - IGMP - DHCP.- Networking Devices - Repeaters - Switches - Bridges - Routers – Gateways.

UNIT 4 TRANSPORT LAYER

9 Hrs.

TCP- UDP - Connection Management - Flow Control - Retransmission - Congestion Control – Leaky bucket algorithm - Detection and Avoidance.

UNIT 5 APPLICATION LAYER

9 Hrs.

Message Handling System(MHS) – FTAM – Virtual Terminal (VT) – Domain Name System - FTP - WWW and HTTP - SNMP - SMTP – POP3 - IMAP – MIME - TELNET

**MAX. 45
Hours.**

COURSE OUTCOMES:

On completion of the course, student will be able to

- CO1: Describe the architecture of a computer network and explain how each device in a network communicates with each other.
- CO2: Explain packet collision in the link layer and how they are corrected.
- CO3: Design a routing protocol in a network and demonstrate how data packet will reach to the intended destination.
- CO4: Implementation of flow control mechanism to regulate the traffic in a network.
- CO5: Describe IP addressing and explain its functions.
- CO6: Recognize various application layer protocols and its functions.

TEXT / REFERENCE BOOKS:

1. Behrouz A. Fourouzan, "Data Communication and Networking", Fifth Edition, McGraw-Hill Education India Pvt. Ltd - New Delhi., 2013.
2. William Stallings, Data and Computer Communications (8th ed.), Pearson Education, 2007.
3. P.C. Gupta, Data Communications and Computer Networks, Prentice-Hall of India, 2006.
4. Andrew S. Tanenbaum, "Computer Networks", Fifth Edition, Pearson, 2011.

SITA1501	WIRELESS SENSOR NETWORK AND ARCHITECTURE	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To Learn basics of Sensor and Network technology
- Learn key routing protocols for sensor networks and main design issues
- Learn transport layer protocols for sensor networks, and design requirements
- Understand the medium access control protocols and address physical layer issues
- To learn the security features in WSN.

Unit 1 Introduction and Overview of Wireless Sensor Networks

9Hrs.

Introduction, Brief Historical Survey of Sensor Networks, and Background of Sensor Network Technology, Ad-Hoc Networks, Applications of Wireless Sensor Networks: Sensor and Robots, Reconfigurable Sensor Networks, Highway Monitoring, Military Applications, Civil and Environmental Engineering Applications, Wildfire Instrumentation, Habitat Monitoring, Another Taxonomy of WSN Technology, Basic Sensor Network Architectural Elements, Home Control, Medical Applications.

Unit 2 Routing protocols for Ad Hoc wireless networks

9 Hrs.

Designing issues, classification of routing protocols, table driven routing protocols, on demand routing protocol, Hybrid routing protocol, Hierarchical routing protocols. Multicast routing in Ad Hoc wireless networks: Operations and classification of multicast routing protocols, Tree based multicast routing protocol, Mesh based multicast routing protocol.

Unit 3 System architecture and design issues

9Hrs.

Design Constraints for Routing in Wireless Sensor Networks, Classification of Routing Protocols in Wireless Sensor Networks-Hierarchy Role of Nodes in the Network, Data Delivery Model, Optimization Techniques for Routing in Wireless Sensor Networks, Application of the Optimization Techniques: Routing Protocols.

Unit 4 Routing Protocols for Wireless Sensor Networks

9 hrs

Introduction, Data Dissemination and Gathering, Routing Challenges and Design Issues in Wireless Sensor Networks Network Scale and Time-Varying Characteristics, Resource Constraints, Sensor Applications Data Models, Routing Strategies in Wireless Sensor Networks: WSN Routing Techniques, Flooding and Its Variants, Sensor Protocols for Information via Negotiation, Low-Energy Adaptive Clustering Hierarchy, Power-Efficient Gathering in Sensor Information Systems, Directed Diffusion, Geographical Routing.

Unit 5 Transport layer security protocols for Ad Hoc wireless networks

9 Hrs.

Designing issues, classification of transport layer solutions, feedback based TCP, TCP bus, Ad Hoc TCP, Security in Ad hoc wireless networks, Issues and challenges in security provisioning, Key management, Secure routing in Ad hoc wireless networks. Quality of Service: Issues and challenges in providing QoS in Ad Hoc wireless networks, classification of QoS solutions.

Max.45Hours

COURSE OUTCOMES:

On completion of the course the student will be able to

CO1: An Ability to understand the concepts of sensors.

CO2: An Ability to analyse modelling and simulation of various communication networks.
CO3: Demonstrate knowledge of MAC protocols developed for WSN. CO4: Demonstrate knowledge of routing protocols developed for WSN. CO5: Understand and explain mobile data-centric networking principles CO6: An Ability to understand the security features in WSN

TEXT/REFERENCE BOOKS:

1. Ibrahim M.M. El Emary, Ramakrishnan.S, "Wireless Sensor Networks From Theory to Applications", CRC Press, 2013.
2. Fei Hu, Xiaojun Cao, "Wireless Sensor Networks Principles and Practice", CRC Press, 2010.
3. MounirFrikha, " Ad hoc Networks Routing, Qos and Optimization", Wiley, 2011.
4. Raheem, Beyah, Janise McNair, Cherita Corbett, Security in Ad hoc and Sensor Networks", World Scientific, 2010.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration:3 Hrs.

Part A: 10 questions carrying 2 marks each – No choice

20 marks

Part B: 2 questions from each unit of internal choice, each carrying 16 marks

80 marks

SITA1503	FOG AND CLOUD COMPUTING	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To understand the basic concepts of cloud computing and cloud enables.
- To understand cloud services and Multi-tenancy computing
- To study about various models of cloud environments and virtualization.
- To manage the cloud computing infrastructure with security.
- To gain knowledge of cloud and to understand about Fog, edge computing.

UNIT 1 UNDERSTANDING CLOUD COMPUTING

9 Hrs.

Basic Concepts and Terminology - Cloud Computing Architectural Framework - Types of Clouds - pros and cons of cloud computing – Cloud Characteristics - difference between web 2.0 and cloud - key challenges in cloud computing - Major Cloud players - Virtualization in Cloud Computing - Parallelization in Cloud Computing - cloud resource management – Cloud Enabling Technology

UNIT 2 CLOUD SERVICE MODELS

9 Hrs

Software as a Service (SaaS) - Infrastructure as a Service (IaaS)- Platform as a Service (PaaS)- Web services - Service Oriented Architecture (SoA) - Elastic Computing - On Demand Computing- Service Management in Cloud Computing - Multi-tenancy computing , architecture.

UNIT 3 CLOUD DEPLOYMENT MODELS and VIRTUALIZATION

9 Hrs.

Deployment models: Public cloud – Private Cloud –Hybrid cloud – Community cloud - Need for virtualization – Types of Virtualization – Virtualization OS – VMware, KVM – System VM – Process VM - Virtual Machine Monitor – Properties - Xen, Hyper V, Virtual Box, Eucalyptus .

UNIT 4 MANAGEMENT IN CLOUD COMPUTING &SECURITY

9 Hrs.

Cloud data centres - Energy efficiency in data centre - Data Management in Cloud Computing - Mobile cloud computing
service models – Open Source and Commercial Clouds, Cloud Simulator – sensor cloud-
Fundamental Cloud security – Cloud security Threads – Additional considerations – Security solutions a case study.

UNIT 5 FOG COMPUTING

9 Hrs.

From Cloud to Fog - Fog Computing architecture - fog networks - Principles of Edge/P2P networking
- Security and privacy in Fog.

Max.45Hours

Course Outcomes:

On completion of the course, student will be able to

Employability g setup with its vulnerabilities and applications using different architectures.

- CO2: Implement and install the cloud tools to make enable the cloud computing infrastructures.
- CO3: Apply and design suitable Virtualization concept, Cloud Resource Management and collaboration services.
- CO4: Create combinatorial auctions for cloud resources and services for computing clouds Develop and make cloud services as commercial.
- CO5: Assess cloud and cloud to Fog with IoT.
- CO6: Ability to, understand fog computing architecture

TEXT / REFERENCE BOOKS

1. Cloud computing concepts, technology and Architecture – Thomas Erl, ZaighamMahmood, Ricardo Puttini , Pearson ,2017.
2. Instant Guide to Cloud Computing, AnandNayar(Ed), Ashokkumar, sudeepTanwar, BPB, 2019.
3. Cloud computing a practical approach - Anthony T.Velte, Toby J. Velte Robert Elsenpeter TATA McGraw - Hill, New Delhi - 2010
4. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online - Michael Miller - Que 2008
5. Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Ronald L. Krutz, Russell Dean Vines, Wiley- India, 2010
6. Fog Computing Concepts, Frameworks and Technologies ,Mahmood, Zaigham (Ed.), Springer , 2018.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration:3 Hrs.

Part A: 10 questions carrying 2 marks each – No choice

20 marks

Part B: 2 questions from each unit of internal choice, each carrying 16 marks

80 marks

SITA1602	CYBER SECURITY	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To explore the aspects of classic and public key cryptography
- To acquire knowledge on standard algorithms used to provide confidentiality, integrity and authenticity
- To become aware of system security components
- To know the technological aspects of security
- To explore the vulnerabilities in any computing system

UNIT 1 INTRODUCTION

9 Hrs.

Basic Concepts – Security Architecture, Attacks, Services, Mechanisms, Model - Cryptography Basics - Symmetric Ciphers – Transposition, Substitution, Rotor Machines – Block Cipher – Data Encryption Standard – Confidentiality using Symmetric Encryption

UNIT 2 PUBLIC KEY CRYPTOGRAPHY

9 Hrs.

Principles – RSA algorithm – Key Management – Diffie Hellman Key Exchange – Message Authentication – Requirements, Functions, Message Authentication – Hash Functions – Digital Signatures – Authentication Protocols

UNIT 3 SYSTEM SECURITY

9 Hrs.

Intruders – Detection – Password Management – Malicious Software – Virus – Countermeasures – Distributed Denial of Service Attacks – Firewalls – Design Principles – Trusted Systems

UNIT 4 OPERATIONS AND PHYSICAL SECURITY

9 Hrs.

Origin – Process – Laws – Physical Security – Controls – Protecting People – Protecting Data – Protecting Equipment

UNIT 5 APPLICATION SECURITY

9 Hrs.

Software Development Vulnerabilities – Buffer Overflow – Race Condition – Web Security – Database Security - Tools

Max. 45 Hours.

COURSE OUTCOMES:

On completion of the course, the student will be able to:

- CO1: Identify the basics of cryptography
- CO2: Provide security of the data over the network.
- CO3: Explore the aspects of system security
- CO4: Illustrate operations and physical security aspects
- CO5: Analyse the vulnerabilities in any computing system and hence be able to design a security solution
- CO6: Design and implement secure applications.

TEXT/REFERENCE BOOKS:

1. William Stallings, "Cryptography and Network Security", Fourth Edition, Pearson, 2009.
2. Jason Andress, Steven Winterfeld, "The Basics of Information Security", Second Edition, Elsevier, 2014.
3. Harold F.Tipton, Micki Krause Nozaki, "Information Security Management Handbook", Sixth Edition, Vol.5, CRC Press, 2012
4. Behrouz A. Forouzan, "Cryptography and Network Security", Tata McGraw-Hill, 2008.

SITA1601	MOBILE APPLICATION DEVELOPMENT	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To understand basic concepts of mobile technologies, different operating systems and how to work with Android .
- To develop applications for current and emerging mobile computing devices, performing tasks at all stages of the software development life-cycle.
- To learn how to code with objective C programming.
- To design, implement and deploy mobile applications for iOS .
- To design, implement and deploy mobile applications for windows OS.

UNIT1 INTRODUCTION TO ANDROID 9 Hrs.

Introduction to mobile technologies, mobile operation systems - pros and cons, Introduction to Android, Features, Architecture, UI Widgets and Events handling, Layouts, Application structure, Android Manifest file, Creating Android applications.

UNIT2 BUILDING BLOCKS AND DATABASE S9Hrs.

Introduction to Activities and Intents - Understanding Activity life cycle, Linking Activities, Passing Data, Toast, Displaying a Dialog Window and Notifications. Content Provider, Services, Broadcast receivers, accessing databases, Location and sensors, Multimedia audio, video and camera, Deploying and publishing application.

UNIT3 OBJECTIVE C PROGRAMMING 9 Hrs.

Objective C - Objects and Classes, Property, Messaging, Categories and Extensions, Fast Enumeration - NSArray, NSDictionary, Methods and Selectors, Static & Dynamic objects, Exception handling, Memory management, Swift language essentials: Arrays, Dictionaries, functions.

UNIT4 INTRODUCTION TO IOS 9Hrs.

Introduction to iPhone, MVC Architecture, View Controller - Building the UI and Event handling, Application life cycle, Tab Bars, Story Boards and Navigation Controllers, Table View, Push Notification, Database handling, Introduction to icloud, Webkit framework in iOS8, Deploying and publishing application.

UNIT 5 WINDOWS MOBILE APP DEVELOPMENT 9 Hrs.

Introduction to Windows Phone 8, Application Life cycle, UI Designing and events, Building, Files and Storage, Network Communication, Push Notification, Background Agents, Maps and Locations, Data Access and storage, Introduction to silverlight and XAML, Data Binding, Deploying and Publishing.

MAX. 45 Hours.

COURSE OUTCOMES:

On completion of the course, student will be able to

- CO1: Understand the technologies and business trends impacting mobile applications.
- CO2: Understand and remember the components of android, iOS and Windows mobile applications.
- CO3: Learn the programming languages and techniques for developing mobile applications.
- CO4: Develop mobile applications with compelling user interface and database connectivity for real time applications for iOS.
- CO5: Deploy mobile applications with compelling user interface and database connectivity for real time applications for Windows OS.

CO6: Develop and deploy mobile applications using silverlight

TEXT / REFERENCE BOOKS:

1. Reto Meier, "Professional Android Application Development", Wrox, 2010.
2. <http://www.tutorialspoint.com/android/index.htm>
3. <http://developer.android.com/training/index.html>
4. Stephen G. Kochan, "Programming in Objective C", Dorling Kindersley India Pvt.Ltd, 2012.
5. David Mark, Jack Nutting and Jeff LaMarche, "Beginning iOS 6 Development Exploring the iOS SDK", Apress, 2013.
6. Henry Lee, Eugene Chuvyrov, " Beginning Windows Phone App Development", Apress 2012.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration:3 Hrs.

Part A: 10 questions carrying 2 marks each – No choice

20 marks

Part B: 2 questions from each unit of internal choice, each carrying 16 marks

80 marks

SITA2601	MOBILE APPLICATION DEVELOPMENT LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- To develop applications for current and emerging mobile computing devices, performing tasks at all stages of the software development life-cycle.
- To learn how to utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces.
- To understand the programming languages and platform for developing mobile applications.
- To design, implement and deploy mobile applications using an appropriate software development environment.
- To upload the developed application into the Android play store.

LIST OF EXPERIMENTS:

1. To implement mobile application life cycle methods.
2. To implement simple calculator application.
3. To implement simple SMS application.
4. To implement authentication verification application without and with database.
5. To implement navigation application with multiple pages / activities.
6. To implement student placement registration form with database.
7. To implement a simple notification application.
8. To implement simple intent with data passing application.
9. To implement simple profile changer application through SMS.
10. To create mobile web browser application.
11. To create mobile e-mail application to sent a mail.
12. To add Google maps to an Android application.
13. To create photo show application
14. To create app to upload a document
15. Mini project

NOTE:

1. Above applications have to be created and deployed in Android OS.
2. Environment Required: Android SDK / Android Studio.

COURSE OUTCOMES:

On completion of the lab, student will be able to

CO1: Understand how to set up Android Development Environment.

CO2: Design various Android UI components.

CO3: Develop Android applications using Java.

CO4: Develop Android applications by using Eclipse with ADT / Android Studio.

CO5: Create real time applications using Android database connectivity.

CO6: Deploy the Android App into play store.

SITA3008	INTERNET OF THINGS	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To understand the concepts of IoT
- To identify the various elements of an IoT System
- To understand the various means of communication from Node / Gateway to Cloud Platforms
- To understand Cloud Computing & its relevance in IoT
- To identify types of data analytics and data visualization tools
- To make students aware of security concerns and challenges while implementing IoT solutions

UNIT 1 INTRODUCTION TO IOT 9 Hrs.

Introduction to IoT, Current technological trends and future prospects, - Evolution of IoT , Business Scope, Relation with embedded system, - Basic Architecture of an IoT, From M2M to IoT, M2M towards IoT, IoT Value Chains, An emerging industrial structure for IoT.

UNIT 2 ELEMENTS OF IOT 9 Hrs.

Application Sensors & Actuators - Edge Networking (WSN) – Gateways - IoT Communication Model – WPAN & LPWA, Overview of IoT supported Hardware platforms such as: Raspberry pi, ARM Cortex Processors, Arduino and Intel Galileo boards, Wearable Development Boards

UNIT 3 COMMUNICATION AND CONNECTIVE TECHNOLOGIES 9 Hrs.

IoT Communication Model, Cloud computing in IoT, IoT in cloud architecture, Logging on to cloud, Selecting and Creating cloud service , cloud based IoT platforms - IBM Watson, Google cloud.

UNIT 4 DATA ANALYTICS AND IOT PLATFORM 9 Hrs.

Big Data Analytics , Apache Hadoop, Using Hadoop MapReduce for Batch Data Analysis, ApacheStorm, Data Visualization, Visualization tools for IoT

UNIT 5 HANDS-ON PROJECTS 9 Hrs.

Industry 4.0 concepts. Sensors and sensor Node and interfacing using any Embedded target boards (Raspberry Pi / Intel Galileo/ARM Cortex/ Arduino), DIY Kits – Soil moisture monitoring, Weather monitoring, Air quality Monitoring, Movement Detection.

Max. 45 Hours

COURSE OUTCOMES:

On Completion of course the student will be able to

- CO1 :To learn and understand the technology and current trends in Internet of things.
- CO2 :To understand the various elements of IoT system and hardware devices.
- CO3 :To learn the programming languages and platforms for building IoT applications.
- CO4 :To understand the cloud computing and its relevance for developing IoT applications.
- CO5 :To design and implement IoT applications that manages big data with data analytics and visualization tools.
- CO6 :To implement hands-on projects using an appropriate software and hardware devices in various applications.

TEXT / REFERENCE BOOKS :

1. The Internet of Things: Applications and Protocols, Wiley publications. Author(s): Oliver Hersent, David Boswarthick, Omar Elloumi
2. Architecting the Internet of Things, Springer publications. Author(s): Dieter Uckelmann, Mark Harrison, Florian Michahelles
3. Internet of Things with Arduino Cookbook, Packt Publications. Author(s): Marco Schwatz
4. Internet of Things and Data Analytics, Wiley Publications.

END SEMESTER EXAM QUESTION PAPER PATTERN**Max. Marks: 100****Exam Duration: 3 Hrs.**

Part A: 10 questions carrying 2 marks each – No choice

20 marks

Part B: 2 questions from each unit of internal choice, each carrying 16 marks

80 marks

SITA2302	PROGRAMMING IN JAVA LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- To implement Object Oriented concepts in Java
- To implement Packages, Interfaces and Multithreading Concepts.
- To develop applications using lang and io packages.
- To design web based application.
- To design GUI application design using swing controls.

CYCLE -1

1. Write a Java program using Classes and Objects.
2. Write a java Program using various types of Constructors.
3. Implement the concept of following kinds of Inheritance for Employee
Application Single Inheritance.
Multilevel
Inheritance.
Hierarchical
Inheritance.
4. Write a Java Program to access various members of super class using Super Keyword
5. Write a java program that illustrates the example for abstract class.
7. Write a java program to find area of various shapes using interface.
8. Write a java Program to create custom package to implement calculator operations.
9. Write a java program that describes the exception handling mechanism.
10. Write a java program that describes the user defined exception.
11. Write a program to create thread by extending Thread Class or by implementing Runnable Interface.
12. Write a java program to create copy of a given object using ICloneable interface.

Cycle2

13. Write a Java Program to implement Wrapper classes and their methods.
14. Write a java program for handling input and output operations using,
 - a. Input Stream and Output Stream classes
 - b. Reader and Writer Classes
 - c. Data Output Stream and Data Input Stream classes.
15. Write a java program that describes the life cycle of an applet.
16. Write a java program to pass parameters to Applet and display the output.
17. Write a java program for event handling using awt controls
18. Write a Java program to handle Mouse and Key events
19. Create a Java Application Programming Interface by using swing controls
20. Write a java program for database connectivity using JDBC.

COURSE OUTCOMES:

- On completion of the course the student will be able to
- CO1: Ability to implement application programs using java object oriented concepts
 - CO2: Able to implement interface, package and multithread concepts
 - CO3: Understand various built in packages and its applications
 - CO4: Knowledge on designing web based applications using applet programming
 - CO5: Create applications using swing controls in real time applications.
 - CO6: Able to connect frontend and backend using database connectivity.



SITA2401	NETWORKING LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- To understand how to implement socket programming.
- To be familiar with simulation tools.
- To understand how to create applications using TCP and UDP.
- To gain Knowledge on various networking protocols.

LIST OF EXPERIMENTS:

1. Study of Socket Programming and Client – Server model.
2. Creation of Date Server, and also print the client's address on the Server.
3. Applications using TCP Sockets like
 - a. Echo client and echo server
 - b. Chat
 - c. File Transfer
4. Applications using TCP and UDP Sockets like
 - a. DNS
 - b. SNMP
 - c. File Transfer
5. Calculation of Checksum for packet data and file.
6. Program to implement HTTP Protocol.
7. Implementation of Stop and Wait Protocol and Sliding Window Protocol.
8. Simulating PING and TRACEROUTE commands.
9. Study of Network simulator (NS) and Simulation of Congestion Control Algorithms using NS.
10. Perform a case study about the different routing algorithms to select the network path with its optimum and economical during data transfer.
 - i. Link State routing
 - ii. Flooding
 - iii. Distance vector
11. WiFi Simulation.

COURSE OUTCOMES:

On completion of the course, student will be able to

- CO1: Analyze the performance of the protocols in different layers.
- CO2: Implement various protocols.
- CO3: Design with simulation tools.
- CO4: Analyze various routing algorithms.
- CO5: Construct Wi-Fi model.
- CO6: Understand socket programming.

SITA1502	CUSTOMER INTERFACE DESIGN AND DEVELOPMENT	L	T	P	Credits	Total Marks
		3	*	0	3	100

COURSE OBJECTIVES

- To effectively design with a range of technologies.
- To develop static websites & dynamic web applications.
- To learn new emerging web technologies.
- To gain knowledge and skills required for web development careers.
- To develop skills in the use and application of specific methods in user experience design.

UNIT 1 HTML, XML, CSS & RWD

9 Hrs.

Introduction To HTML- DHTML , XML – Structuring XML document using DTD – Schemas – XML parsers – DOM – SAX presentation technologies – XSL – XFORMS – XHTML – Transformations – XSLT – XLINK – XPATH – XQuery. Responsive Web Design-Intro-Fluid Grid-Viewport-Media Queries-Images.

Introduction To CSS-Syntax,Selectors-Types of style sheets.

UNIT 2 CLIENT SIDE SCRIPTING

9Hrs.

Java Script – Advantages – Data types – Variables – Operators – Control statements – Functions – Objects and arrays – Windows and frames – Forms.AJAX – XMLHttpRequest (XHR) – Create Object – Request – Response – Ready state.

UNIT 3 SERVER SIDE SCRIPTING

9 Hrs.

Introduction To PHP – Data Types – Control Structures – Arrays - Function – Html Form with PHP – Form Handling & Validation - File Handling – Cookies – Sessions – Filters – Exception Handling - Database Connectivity With MySQL.

UNIT 4 ANGULAR JS & JQUERY

9 Hrs.

Angular JS Expression – Modules – Directives – Data Binding – Controllers – Scopes – Filters – Services – Tables – Events – Form – Validation.

jQuery Syntax – Selects – Events – jQuery Effects – jQuery – jQuery HTML – jQuery Traversing

UNIT 5 UX & UI

9 Hrs.

UX Introduction -Elements of UX Design- UX Design Process- Research Methods and Tools- Understanding User Needs and Goals. UX Design Process: Visual Design Principles-Information Design and Visualization-Interaction Design- Prototyping Tools-Usability Test.UI Introduction-User Interface Components -Tools and Processes.

Max.45Hours

COURSE OUTCOMES:

On completion of the course the student will be able to

- CO1: Able to work with XML technologies.
- CO2: Design web page to perform form validation using client-side scripting language.
- CO3: Implement new technologies such as Angular JS & jQuery.
- CO4: Develop web applications using server-side scripting language.
- CO5: Understand the differences between usability and user experience.
- CO6: Effectively select and utilize design thinking processes and UX/UI tools.

TEXT /REFERENCE BOOKS:

1. Jeffrey C. Jackson, WebTechnologies: A Computer Science Perspective, Pearson Education, 2009
2. Kogent Learning Solutions Inc., Web Technologies Black Book, Dreamtech Press, 2009.
3. Ken Williamson, Learning AngularJS: A Guide to AngularJS Development, O'Reilly, 2015
4. Jon Duckett, JavaScript and JQuery: Interactive Front-End Web Development, John Wiley & Sons Inc., 2014.
5. CallumMacrae, Learning from JQuery, O'Reilly, 2013.
6. Steve Krug,Dont Make Me Think,SecondEdition,New Riders Publishing,USA,2006.

END SEMESTER EXAM QUESTION PAPER PATTERN

Max. Marks: 100

Exam Duration:3 Hrs.

Part A: 10 questions carrying 2 marks each – No choice

20 marks

Part B: 2 questions from each unit of internal choice, each carrying 16 marks

80 marks

SITA2501	CUSTOMER INTERFACE DESIGN AND DEVELOPMENT LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- To be familiar with mark-up languages and style sheets
- To learn XML technologies and AJAX
- To develop static websites and dynamic web applications
- To gain knowledge and skills required for web development careers.
- To create web page using PHP.

LIST OF EXPERIMENTS:

1. Design a web page for your university using HTML
2. Create an Internal and External Style sheet.
3. Working with XML and CSS
4. Write a JavaScript code to perform form validation.
5. Working with AJAX
6. Working with Angular JS Directives
7. Working with Angular JS Expressions
8. Working with jQuery Selectors
9. Working with jQuery Events & Effects
10. Program to perform PHP Form Validation
11. Program to demonstrate PHP Form Handling
12. Program to create PHP Database Application using MySQL

COURSE OUTCOMES :

On completion of the course the student will be able to

CO1: Implement static web pages using mark-up languages and style sheets

CO2: Implement form validation using client-side scripting language

CO3: Implementation of new technologies: Angular JS & jQuery

CO4: Develop web applications using server-side scripting language

CO5: Develop web applications with database connectivity.

CO6: Create web page using PHP concepts

SITA2602	BIG DATA ANALYTICS LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- To configure Big Data Ecosystem
- To work with No SQL Databases
- To process job scheduling
- To Analyse and Interpret Data
- To visualize the data insights

To learn, deploy and execute programs on the following technologies.

1. No SQL (using Cassandra/MongoDB/Spark)
2. Hadoop – Map Reduce Programs / Commands / Job Scheduling
3. HDFS
4. YARN
5. Working with Pig and Hive
6. Visualization (using Tableau Cloud)

COURSE OUTCOMES:

- CO1: Able to setup Hadoop in a Cloud / Cluster environment
CO2: Process and schedule the tasks in the Hadoop platform
CO3: To configure nosql databases in the big data ecosystem
CO4: Selection of right visualization method based on the intended audience
CO5: Creates a dashboard and story based on the data analysis
CO6: Test and evaluate the data models



SITA2701	AI AND MACHINE LEARNING LAB	L	T	P	Credits	Total Marks
		0	0	4	2	100

COURSE OBJECTIVES

- To implement various machine learning algorithms.
- To learn how to build Artificial Neural Network.
- To understand how to learn Data sets with the help of machine learning algorithms.
- To Apply EM algorithm to cluster a set of data stored in a .CSV file.
- To be familiar with PROLOG tool.

LIST OF PROGRAMS

1. Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.
2. For a given set of training data examples stored in a .CSV file, implement and demonstrate the **Candidate- Elimination algorithm** to output a description of the set of all hypotheses consistent with the training examples.
3. Write a program to demonstrate the working of **the decision tree based** ID3 algorithm. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.
4. Build an Artificial Neural Network by implementing the **Back propagation algorithm** and test the same using appropriate data sets.
5. Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets.
6. Assuming a set of documents that need to be classified, **use the naïve Bayesian Classifier model** to perform this task. Built-in Java classes/API can be used to write the program. Calculate the accuracy, precision, and recall for your data set
7. Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set. You can use Java/Python ML library classes/API.
8. Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same data set for clustering using **k - Means algorithm**. Compare the results of these two algorithms and comment on the quality of clustering. You can add Java/Python ML library classes/API in the program.
9. Write a program to implement **k-Nearest Neighbour algorithm** to classify the iris data set. Print both correct and wrong predictions. Java/Python ML library classes can be used for this problem.
10. Study of PROLOG. Write the following programs using PROLOG
11. Write a program to solve 8 queens problem
12. Solve any problem using **depth first search**.
13. Solve any problem using **best first search**.
14. Solve 8-puzzle problem using best first search.
15. Solve **travelling salesman problem**

COURSE OUTCOMES

After studying this course, the students will be able to

- CO1: Apply various machine learning algorithms.
- CO2: Design Java/Python programs for various Learning algorithms.
- CO3: Apply appropriate data sets to the Machine Learning algorithms.
- CO4: Identify and apply Machine Learning algorithms to solve real world problems.
- CO5: Apply EM algorithm to cluster a set of data stored in a .CSV file.
- CO6: Implement programs with PROLOG.

SITA3003	ADVANCED JAVA PROGRAMMING	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

- To know about Enterprise architecture models.
- To introduce the basics of session tracking.
- To understand JSP and to write Custom Tags.
- To know about the development of Enterprise Java Beans.
- To have knowledge in advanced Java programming concepts.

UNIT 1 INTRODUCTION & DATABASE PROGRAMMING

9 Hrs.

J2EE Platform – Enterprise architecture styles – J2EE run times – J2EE API – J2EE architecture – Containers –Introduction to J2EE technologies – Naming and directory services. Database programming with JDBC – JDBC/ODBC bridge – Establishing a connection – Creating and executing SQL statements – Querying – Report statements – Scrollable and updatable result sets – Java.sql packages – JDBC data sources – Connection pooling.

UNIT 2 SERVLET PROGRAMMING

9 Hrs.

Introduction to Servlet Programming - Servlet Implementations - Servlet configuration - Servlet exceptions - Servlet Life Cycle - Servlet Programming - Servlet Security- Servlet communication - Advanced Servlets : Approach to Session Tracking - Demonstrating Session - Lifecycle with Cookies - A simple shopping cart using Sessions - Servlet Context Interface - Servlet Collaboration.

UNIT 3 JSP AND JAVA MAIL

9 Hrs.

Java Server Pages : Intro to JSP - JSP Directives - Scripting elements - Standard Auctions - Implicit objects - Scope - JSP pages as XML documents - JSP Sample Program - Design Strategies - JSP tag Extensions-A simple TAG - Writing TAG Extensions. Java Mail API: Introduction to Java Mail - Mail Protocols- Java Mail Overview- Quick, Send me a Email: An example program

UNIT 4 ENTERPRISE JAVA BEANS

9 Hrs.

Overview of EJB-EJB Middleware Architecture - EJB Architecture- EJB Containers and its services - Design of EJB Tier - Session java Beans- Stateless and Stateful Beans, Entity Beans and Persistence - Container Vs Bean Managed Persistence, Message Driven Bean - Relationships, EJB Container Services.

UNIT 5 STRUTS

9 Hrs.

Struts: Development Models-Basic Components of Struts – Struts2 Architecture-Interceptors-Validation- Building simple struts Application.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

- CO1 - Implement JDBC connectivity.
- CO2 - Implement advanced Servlets.
- CO3 - Implement JSP and Java Mail.
- CO4 - Implement EJB.
- CO5 - Implement Struts.
- CO6 - To develop enterprise java applications thereby meeting the industrial requirements.

TEXT / REFERENCE BOOKS

1. Subrahmanyam Allamaraju and Cedric Buest , "Professional Java Server Programming", A press,J2EE 1.3, 2007.
2. Jim Keogh , "Completer Reference, J2EE",Tata McGraw Hill, 2007.
3. James Holmes-Structs,"The complete Reference", 2nd Edition, Tata McGraw Hill, 2007.
4. <http://www.java.sun.com/tutorial>.